UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/792,268	03/03/2004	Stephen G. Evangelides JR.	9005/45	4231

27774 7590 07/14/2006

MAYER & WILLIAMS PC
251 NORTH AVENUE WEST
2ND FLOOR
WESTFIELD, NJ 07090

EXAMINER	
MALKOWSKI, KENNETH J	

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 07/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/792,268	EVANGELIDES, STEPHEN	
	Examiner	Art Unit	
	Kenneth J. Malkowski	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/2/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by "Modeling of Transoceanic Fiber-Optic WDM Communication Systems," IEEE Journal of Selected Topics in Quantum Electronics, Vol. 6 No. 2, March/April 2000 to Golovchenko et al.

With respect to claims 1-3, Golovchenko discloses a method for monitoring optical signal quality between land-based terminal equipment and an undersea optical transmission path (page 337 column 2 paragraph 2 (predict system performance in a long-haul undersea WDM transmission system)), said method comprising the steps of: receiving an analog optical signal (all digital signals inherently include analog characteristics which can be measured. In the abstract of applicants application, applicant states that a Q-factor measurement measures such analog characteristics. Golovchenko also teaches Q-factor measurement to measure said analog characteristics of a digital signal (page 344 column 1 paragraphs 5-6 evaluating system performance, wherein the performance of each data channel is defined by Q-factor)) in which information is embodied in digital form (page 339 column 1 paragraph 2 (signals transmitted had a voltage variation zeros and one, could be checked with a digital oscilloscope)) from either of the terminal equipment or the undersea optical

transmission path (page 344 column 1 paragraph 5 (our modeling and simulation techniques are used to evaluate the performance of undersea optical transmission systems)); and measuring a parameter reflecting signal quality by analysis of the analog optical signal and not the information digitally embodied therein (page 338 column 1 paragraph 2 (as a system performance metric the Q-factor is measured and calculated)(page 346 column 1 (calculates Q-factors and eye diagrams in an efficient manner, (q-factor measurements are based off analog signals which inherently comprise a signal spectrum)))(Figure 11 displays a measured signal spectrum in upper left corner)(Fig 3 depicts transmitted channels and accompanying spectrum in the inset))

With respect to claims 4-7 and 12-15, Golovchenko discloses a method for providing optical-level connectivity between land-based terminal equipment (Figure 2, WDM transmitter and WDM receiver) and an undersea optical transmission path (Figure 2, optical transmission line between transmitter and receiver)(page 338 paragraph 1 (transoceanic link operates in a saturation regime that allows us to estimate the amount of noise accumulated in the system)), said method comprising the steps of: receiving an analog optical signal in which information is embodied in digital form from the terminal equipment (all digital signals inherently include analog characteristics which can be measured. In the abstract of applicants application, applicant states that a Q-factor measurement measures such analog characteristics. Golovchenko also teaches Q-factor measurement to measure said analog characteristics of a digital signal (page 344 column 1 paragraphs 5-6 evaluating system performance, wherein the performance of

each data channel is defined by Q-factor)); measuring a parameter reflecting signal quality by analysis of the analog optical signal and not the information digitally embodied therein (Figure 1)(page 338 column 1 paragraph 2 (Q-factor is performance metric measured and calculated for each WDM channel)); performing at least one optical-level signal process on the analog optical signal consisting of gain equalization (page 338 column 2 paragraph 1 (the use of gain equalization filters at the transmiter generally allows us to obtain equal levels of levels of SNR for all channels)); and directing said analog optical signal onto the undersea optical transmission path (page 337 column 2 paragraph 2 (predict system performance in a long-haul undersea WDM transmission system)).

With respect to claims 9 and 17, Golovchenko discloses the method of claim 4 further comprising the step of monitoring a status of the undersea optical transmission path (page 345-346 column 1 paragrpahs 5 and 1 (measured and calculated the Q-factor performance for the entire wdm transmission system over 7500 km)(Fig 19)(page 344 column 1 paragraphs 1-2 (channels of interest are scanned across the band, test channel is selected, eye-closure penalty is calculated)).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 8 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Modeling of Transoceanic Fiber-Optic WDM Communication Systems," IEEE Journal of Selected Topics in Quantum Electronics, Vol. 6 No. 2, March/April 2000 to Golovchenko et al. in view of U.S. Patent No. 6,687,043 to Davies et al.

With respect to claims 8 and 16, Golovchenko discloses the method of claim 4, however fails to further disclose Raman amplification. Davies, from the same field of endeavor discloses using raman amplication in optical transmission fiber (Fig 1)(column 3 lines 54-65) which he teaches is typically used in undersea systems (column 1 lines 30-33 (Raman amplification is often used in undersea systems)). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to implement the Raman amplifier as taught by Davies with the EDFA amplifier taught in Golovchenko. The motivation for doing so would have been that Raman amplifiers allow longer transmission distances than EDFA amplifiers (Davies: column 1 lines 27-33).

5. Claims 10 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Modeling of Transoceanic Fiber-Optic WDM Communication Systems," IEEE Journal of Selected Topics in Quantum Electronics, Vol. 6 No. 2, March/April 2000 to Golovchenko et al. in view of "Stochastic Amplitude Fluctuation in Coherent OTDR and a New Technique for Its Reduction by Simulating Synchronous Optical Frequency Hopping," Journal of Light-wave Technology, Vol. 15, No. 2 February 1997 to Izumita et al.

With respect to claims 10 and 18, Golovchenko discloses the method of claim 4, however Golovchenko fails to disclose monitoring using COTDR. Izumita, from the

same field of endeavor discloses coherent OTDR as a technique used for fault location in optical fiber transmission systems and further states that such a technique is commonly used (page 267 colun 1 paragraph 2)(Figure 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to implement COTDR as the monitoring system as tuaght by Izumita in place of the monitoring system as used by Golovchenko. The motivation for doing so would have been that using COTDR as a monitoring technique improves receiver sensitivity which is advantageous for direct detection (Izumita: page 267 column 1 paragraph 2).

6. Claims 11 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Modeling of Transoceanic Fiber-Optic WDM Communication Systems," IEEE Journal of Selected Topics in Quantum Electronics, Vol. 6 No. 2, March/April 2000 to Golovchenko et al. in view of U.S. Patent No. 5,936,719 to Johnson et al.

With respect to claims 11 and 19, Golovchenko discloses the method of claim 9, however, Golovchenko fails to disclose employing an autocorrelation technique. Johnson, from the same field of endeavor discloses monitoring using an autocorrelation technique for testing optical fibers (column 4 lines 43-47)(Fig. 3). Therefore, it would have been obvious to one of ordinary skill in the art to implement the autocorrelation technique for monitoring fiber optic transmission as taught by Johnson as the monitoring technique as used in the system of Golovchenko. The motivation for doing so would have been to create a more practical, cost effective monitoring solution (Johnson: page 4 lines 21-25).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to further show the state of the art with respect to optical submarine transmission lines in general:

U.S. Patent No. 6,532,087 is sighted to show a multiple Q-tester

U.S. Patent No. 6,990,294 is sighted to show an optical network with quality control function

U.S. Patent No. 6,744,992 is sighted to show improving performance of optical transmission systems

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth J. Malkowski whose telephone number is (571) 272-5505. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KJM 7/8/06

KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER